REMARKS

This Response, submitted in reply to the Office Action dated May 3, 2005, is believed to be responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

Claims 1-29, 31 and 35-38 remain pending in the application. Claims 1-16, 22, 24-28, 31 and 35-38 have been rejected under 35 U.S.C. § 103 as being unpatentable over Suga (previously of record) in view of Hasegawa (U.S.P. 5,483,634, hereafter "Hasegawa"). Claim 17 has been rejected under 35 U.S.C. § 103 as being unpatentable over Suga in view of Hasegawa and further in view of Mizutani (U.S.P. 6,326,726). Claims 18-19 and 29 have been rejected under 35 U.S.C. § 103 as being unpatentable over Suga in view of Hasegawa and further in view of Yushiya (U.S.P. 5,917,621). Claims 20-21 and 23 have been rejected under 35 U.S.C. § 103 as being unpatentable over Suga in view of Hasegawa and Yushiya and further in view of Mizutani. Applicant respectfully submits the following arguments in traversal of the prior art rejections.

Applicant's invention relates to a monochromatic display which is able to provide a large number of tone levels with adequate luminance. Detailed descriptions of the background and exemplary embodiment of the invention are set forth in the Appeal Brief at pages 6-7. Suga is described in the Appeal Brief at page 10. The Examiner is referred to these discussions.

Turning to the newly cited art, Hasegawa relates to a ferroelectric LCD (FLCD) that provides rapid image processing by providing partial rewriting of an image display. Col. 2, lines 43-67. In the conversion of pixel data to binary data, Hasegawa applies error diffusion to neighboring pixels. In particular, referring to Fig. 2, in binarizing a pixel A, error data corresponding to the address of pixel A is read out from an error frame buffer 37, and the error

data is added to the image data of a pixel A. The result of the addition is converted to binary data based on a predetermined threshold. In Hasegawa, only that portion of the inputted data which was changed from a preceding image plane become binarized (e.g. forced to a 0 value or a 255 value). Col. 4, line 60 to col. 5, line 17. The difference between the actual input data and the resulting binarizing value are diffused to adjacent pixel sites. Col. 5, lines 56-62.

Yushiya relates to an image pick up device to eliminate Moire patterns in an image. In this connection, Yushiya recognizes that the resolution of an image is a function of the mean transfer function (MTF): = (imax-imin)/(imax + imin) x 100. The reference further recognizes that while the distance between R-G and G-B pixels results in an MTF of about 0%, the MTF for the R-B pixels is 30%, which results in Moire fringes. Col. 2, lines 17-55. Yushiya attempts to address this deficiency by careful spacing of its reading pixel elements between elements and within the multiple colors of a single picture element to provide a highly uniform color characteristic over the pixel area. Col. 8, lines 34-41.

Mizutani relates to formation of an organic EL device.

The Examiner maintains that the combination of Suga and Hasegawa teaches each feature of independent claim 1. Applicant submits that the rejection is not supported for at least the following reasons.

First, the Examiner appears to now contend that Suga teaches a monochrome display. However, the Examiner has already previously conceded that Suga does not teach a monochrome display. Final Office Action dated May 11, 2004 at page 3. In view of the fact that Suga teaches RGB pixels, it is clear that Suga does not teach the monochrome device as described by claim 1.

Second, despite the Examiner's rejection at page 3 of the detailed Office Action regarding the disclosure of a monochromatic display in Suga, the Examiner appears to concede at page 4 of the detailed Office Action that Suga fails to teach such a monochromatic display and relies on Hasegawa to make up for this deficiency. The Examiner contends that it would be obvious to combine the teachings of Suga with Hasegawa to provide a rapid display output. Applicant submits that the Examiner's basis for the modification is not supported. The increased speed in image processing in Hasegawa results in part from the partial writing of image data and error-diffusion depending on whether an image area has changed from a prior output. Accordingly, Hasegawa relates to processing on a pixel by pixel basis to provide a binary output, which does not correspond to the cell-by-cell multi-level treatment of image data in Suga.

Third, and relatedly, the error diffusion in Hasegawa would cause a difference in the thresholding levels to binarize the input data. In such a situation, the resulting error diffusions would cause the luminance levels on a per pixel basis to deviate from the input signal level, such that the Examiner's reliance on the binarizing depicted in Figs. 14B-D of Suga would not apply.

Fourth, the Examiner concedes that Suga does not specifically teach that an average of the output luminance of the cells within the picture element corresponds to the output luminance of the picture element. As discussed above, the error diffusion of Hasegawa would lead to a mismatch between input data on a pixel basis (and thus cell basis) and the output luminance. Due to the error diffusion, the cell signal may not determine an output tone level of the cell, due to diffusion from prior processed pixels, so that an average of the output luminances of the cells need not correspond to the pixel element luminance.

Fifth, though the Examiner relies on Figs. 14B-D of Suga for the teaching of average cell values corresponding to the luminance per pixel, the Examiner neglects to take into account that Suga actually includes additional G and B data as outputs for a picture element. These additional color outputs potentially cause deviation from any purported average cell output as corresponding to the luminance per picture element. Therefore, claim 1 is patentable for all the above reasons.

Claim 38 includes features analogous to that of claim 1, except that claim 38 describes that the sum of the cells corresponds to the luminance on a picture element basis. However, the arguments set forth for claim 1 also apply in terms of the recitation of the sum in claim 38. In particular, the error diffusion of Hasegawa would lead to a mismatch between input data on a pixel basis (and thus cell basis) and the output luminance. Due to the error diffusion, the cell signal may not determine an output tone level of the cell, due to diffusion from prior processed pixels, so that a sum of the output luminances of the cells need not correspond to the pixel element luminance.

With regard to independent claim 13, this claim describes the features of monochrome display including cells having three of more levels for tone expression. For the reasons set forth above for claim 1, Suga does not teach a monochrome output, and the binarizing occurring in Hasegawa is not combinable with the multi-level tone disclosure of Suga.

For the reasons set forth above, each of independent claims 1, 13 and 38 are patentable. The remaining claims are patentable based on their dependency as the secondary references of Yushiya and Mizutani do not make up for the deficiencies of the primary references.

With further regard to claim 3, this claim describes that cell signals become generated as so that the luminance of the cells of the picture elements change at an inclination according to a tone gradient vector of picture elements around a respective picture element corresponding to the cell. The Examiner cites the general use of multiple cells per pixel and the discussion of level assignments to teach this feature of claim 3. However, none of the cited portions relate to cell signals in relation to an inclination as claimed.

With further regard to claims 4 and 5, the Examiner cites the same disclosure to teach the feature of these claims as was cited to teach the gradient in claim 3. However, the cited portions do not teach the independent time or intensity modulation. Applicant further submits that the secondary reference of Hasegawa necessarily teaches away from such independent modulation since the diffused error will depend on spatial and time relationships of the picture elements. Therefore, claims 4-5 are patentable for this additional reason.

With further regard to claim 17, this claim describes that the display device is an organic EL panel and that at least two cells emit light in the same color at different luminance. The Examiner cites Mizutani to make up for this deficiency. However, Mizutani only relates to the construction of an organic EL and not the operation thereof with regard to a cell. Therefore, claim 17 is patentable.

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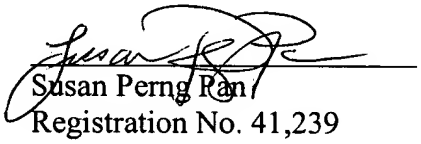
Respectfully submitted,



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